PTO 97-2467

TRANSMISSION AND RECEPTION SYSTEM FOR VIDEO AND DATA
[Eizoo oyobi deeta no soojushin hooshiki]

Kenzou Oono, et al.

UNITED STATES PATENT AND TRADEMARK OFFICE
Washington, D.C.   March 1997

Publication Country	(19) :	JP
Document Number	(11) :	55028691
Document Kind	(12) :	A
	(13) :	PUBLISHED UNEXAMINED PATENT APPLICATION (kokai)
Publication date	(43) :	19800229 [WITHOUT GRANT]
Publication date	(45) :	[WITH GRANT]
Application Number	(21) :	53103291
Application Date	(22) :	19780823
Addition to	(61) :	
International Classification	(51) :	HO4N 7/08; HO4N 7/16; HO4N 7/18
Domestic Classification	(52) :	
Priority Country	(33) :	
Priority Number	(31) :	
Priority Date	(32) :	
Inventors	(72) :	OONO, KENZOU; ASABE,TSUTOMU; YOSHINO, HIROKAZU
Applicant	(71) :	MATSUSHITA DENKI SANGYO K.K.
Title	(54) :	TRANSMISSION AND RECEPTION SYSTEM FOR VIDEO AND DATA
Foreign Title	[54A] :	EIZOO OYOBI DEETA NO SOOJUSHIN HOOSHIKI

1

1.   Title of the Invention:

Transmission And Reception System for Video and Data

2.   Claim:

1. In television or CATV broadcasting, a video and data transmission and reception system is characterized by the fact that in the video section of the video signal contained in the external signal, which is transmitted at a request from a terminal keyboard or a one way service from the station, or a section of the vertical or horizontal synchronous signal, software program data such as a video game or picture data such as figures or letters is superimposed on the controlling data, such as the starting address data for the memory provided in the terminal to store them, the said software program data, the starting data after completing the reception of the picture data, or the selection data to select the display method; the said superimposed data is picked up from the said external signal at the terminal. The said software program data or the picture data is stored in the terminal's memory, and the said stored data is transferred to the refresh memory provided in the terminal at the command from the said controlling data or from the terminal keyboard. At the same time, a video signal contained in the external signal, a superimposed signal obtained by superimposing the picture data output from the said refresh memory on the said video signal, or one screen signal outputted from the refresh

---

'Numbers in the margin indicate pagination in the foreign text.

memory is selected by a switcher and outputted to a television receiver.

3.   Detailed Explanation of the Invention:

This invention pertains to a video and data transmission and reception system.

In video games, having game contents that are advanced and diversified, in order to perform various services, a system which stores video game software on a cassette tape recorder or which records each software on a cartridge and replaces it for each game is employed. This kind of system has problems such that space to house the cartridge is required, and each cartridge must be individualized, making the system uneconomical.

As a method to solve these problems, a method is considered   /414 in which by superimposing software or picture data on a video signal in a broadcasting wave, CATV, or CCTV, and transmitting it to a terminal (home), the corresponding software is picked up at the terminal.

A microcomputer system in which by providing refresh memory to the in house (on line) terminal, data is prepared from a keyboard, and by executing a program, video is outputted to a television receiver, has come into wide use. Hence, a combination of the said video transmission and reception system, in which by superimposing data on a broadcasting wave, etc., the transmission is performed, and a microcomputer system with refresh memory which will be used in house, is in demand.

3

This invention, based on the said background, proposes a video and data transmission and reception system that is constituted so that software data such as a video game, etc. transmitted by a video signal is received and processed; it is designed to switch to the refresh memory output at the terminal, the video signal from outside, or the signal obtained by superimposing the refresh memory output onto this video signal at the command of the control data transmitted by the key operation at the terminal or the video signal so that it is outputted to the television receiver or is made into an adapter for a wide range of uses in televisions.

One example of this invention is explained below referring to the figures. Figure 1 depicts a signal waveform in which data is superimposed on a vertical synchronous section of a video signal; a data signal (B) excluding video signals (A) from a broadcasting station or a CATV station is superimposed on a section of the video signal (A) or, although not shown here, on a section of a vertical synchronous signal (V) or a horizontal synchronous signal, and transmitted to the terminal.

Figure 2 depicts the data format which is constituted of a header part (C), a terminal address part (D), a controlling part (E) and an information part (F). The header part (C) is a designated bit series of n bits and represents the head of the information series. The terminal address part (D) is a designated bit series of m bits for each terminal, which supplies software programs to each terminal and transmits picture images.

4

With this signal, the terminal picks up data. A controlling part (E) contains a selection signal of the data length of the following information part (F): the type (classification whether the data is software program data, picture data superimposed at the terminal, or one screen data of refresh memory of the terminal), the processing method at the terminal, for example the discrimination of whether the service is started upon receiving the software program or after a set time (the delay time is simultaneously transmitted) in the case of the software service, and for outputting the output from the refresh memory screen provided to the terminal, the external signal (the broadcasting wave or CATV signal wave) or the video obtained by superimposing the output from the refresh memory onto the external signal to the television receiver. The information part (F) has a bit with the desired length that is designated at the controlling part (E) and is the software program data, the picture data superimposed at the terminal, or one screen data of the refresh memory of the terminal.

Figure 3 is a diagram depicting the constitution of the terminal. No.(1) represents an RF converter; No.(2) represents a data pickup circuit which picks up the data signal(B) from the video signal (A); No.(3) represents a processing circuit constituted of a microcomputer. No.(4) represents refresh memory for one screen portion which is constituted of video RAM; No.(5) represents a video and audio switcher with a 3 to 1 input and output ratio. No.(6) represents a circuit in which the picture

5

data output from refresh memory (4) and the video signal of the ;
the external signal are superimposed. No.(7) represents an RF
converter; No.(8) represents a synchronous separating circuit.
No.(9) represents the keyboard; No.(10) represents an interface
circuit which is connected to a telephone line, and is
constituted of a sound coupler or a modem. In this case, the
symbol (V) represents a vertical synchronous signal; (H)
represents a horizontal synchronous signal; in some cases, the RF
converters (1) and (7) are not required.

Figure 4 is a diagram depicting the constitution of the
keyboard (9). No.(11) represents a TEL key. By hitting this
key, a connection to a broadcasting station or CATV station is
established. No.(12) represents a program key, which puts the
terminal in a programmable mode using the hexadecimal key (18)
mentioned below. Accordingly, after hitting this key, the
program is prepared by the hexadecimal key (18) so that the
program can be executed. No. (13) represents a mode select key,
which switches the video switcher (5) provided to the terminal.
That is, the request key of the 1st to 3rd video signals of
Nos.(14)-(16) mentioned below becomes effective. By hitting   /415
keys of Nos.(14)-(16), the switcher (5) provided to the terminal
is set in a superimposition enable mode, a superimposing disabled
mode (external signal only) or a refresh memory output mode.
No.(17) represents a registered key of 4 figures. No.(18)
represents an hexadecimal key composed of 16 keys including ten
keys. No.(19) represents a registered clear key. Nos. (20) and

6

(21) represent an address set key and a data set key which are used for storing the address set and data to the processing circuit (3) memory at the terminal and are effective only after hitting the program key (12). No. (22) represents a transmitting key of the registered data. No. (23) represents a program start key; No. (24) represents a terminal reset key; No. (26) represents an external program transmission completion lamp.

When making a request for transmitting video or data to the broadcasting station or CATV station, etc. or requesting a transmission method, after hitting the TEL key (11), according to the prescribed procedure using the registered key (17), the data is transmitted.

When preparing a program at the terminal, after hitting the program key (12), the program is stored in the processing circuit (3) memory using the hexadecimal key (18), the address key (20) and the data store key (21), and then the program is executed using the program start key (23). When one wishes to put the terminal in reception mode, i.e., a video output mode to the television receiver, after hitting the mode select key (13), the key (14)-(16) is hit to select the superimposed signal, the external signal or the refresh memory output.

Next the action of the circuit shown in Figure 3 is explained. By hitting the TEL key (11) of the keyboard (9), the processing circuit (3) forms a data link with the broadcasting station or CATV station, etc. By hitting the registered key (17) followed by the transmitting key (22), the type of video from the

station or the transmitting method is requested (requests for the software number or a transmitting method). An external signal such as a broadcasting wave or CATV wave sent by this, if it is an RF signal, is converted to a base band video signal at the RF converter (1); one is lead to the data pickup circuit (2) to pick up the data signal (B) which is superimposed on the video signal (A) to be decoded; this output is inputted to the processing circuit (3). The processing circuit (3) verifies the terminal address of the terminal address part (C) of the received signal with its own terminal address. When the address is verified, the following data is decoded. In the case of the software data, it is sequentially stored starting with the address specified at the controlling part (E) into the memory of the processing circuit's (3) microcomputer. When an immediate start is specified by the controlling part (E), the input of the switcher (6) is switched to V_1, and a command counter is driven by setting the starting address. By this, services such as a video game are outputted to the television receiver. In the case of data to be superimposed, after the data is stored in memory, the data is written in a specified location in the refresh memory, and the switcher (5) is switched to V_2; in the case of picture data of one screen portion for the refresh memory, similarly after the data is stored in memory, the microcomputer converts the received picture data into data for the refresh memory, transfers it to the refresh memory, and switches the input of the switcher (6) to V_1. As a reception mode of the terminal (input of the switcher), the priority of

8

data which is from the external signal or the keyboard input from the terminal signal is determined according to the computer processing program of the processing circuit (3) of the terminal. In the explanation below, the data from the external signal is assumed to be preferred.

Figure 5 is a flow chart depicting the reception processing at the terminal. The action of the terminal is explained referring to this. The data decoded is always inputted to the processing circuit's (3) microcomputer from the data pickup circuit (2) shown in Figure 3. When the header part (c) shown in Figure 2 is recognized at the processing circuit (3), regarding this as a head output of the transmitted text, the reception mode is set; as mentioned above, the terminal's own address and the transmitted terminal address are compared, if the same, the data reception processing is executed so that the succeeding data is entered into memory. Next, the processing is performed according to information such as data length, type of information, start timing, and video output method inputted into the controlling part (E). In the case of the one screen data for the refresh memory, the data is coded and transferred to the refresh memory (4), and the switcher (6) is switched to V_1. In the case of the data to be superimposed, the data is coded and transferred to the refresh memory (4); and the switcher (6) is switched to V_2. /416
In the case of a software program, the program transfer completed lamp (24) of the keyboard (9) is lit. When a command to execute the program is received immediately, by turning off the program

9

transfer completion lamp (28) and switching the input of the switcher (6) to V_1, the program is executed. In the case of the timer start, after a commanded delayed time, by turning off the lamp (28), the input of the switcher (6) is switched to V_1 so that the program is executed. In the case of the key input mode, by standing by until the program start key (23) of the keyboard (9) is hit, upon entering the input, the program is executed. When the data is not superimposed on the external signal, by switching the switcher (9) to V_3, only the audio signal is outputted.

According to this invention, the software program data or the picture data is superimposed onto a one way signal from outside or a signal received at a request made from the keyboard; when this is received and decoded at the terminal, the video output of the terminal is switched according to a command of the signal received, enabling the television receiver to perform various video services. Moreover, this can be easily constituted simply by adding a data pickup circuit to a simple micro computer system.

4.   Brief Description of the Figures:

Figure 1 is a diagram depicting the waveform of a signal in which the data is superimposed on a vertically synchronous section of a video signal. Figure 2 is a diagram depicting transmitted text. Figure 3 is a diagram depicting the constitution of a terminal. Figure 4 is a diagram depicting the constitution of a keyboard. Figure 5 is a flow chart depicting

10

an action of the terminal.

(2) ... Data pickup circuit; (3) ... Processing circuit; (4) ... Refresh memory; (5) ... Switcher; (9) ... Keyboard; (A) ... Video signal; (B) ... Data signal; (C) ,,, Header part; (D) ... Video address part; (E) ... Controlling part; (F) ... Information part
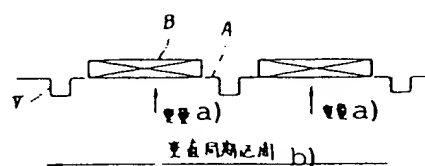

Figure 1
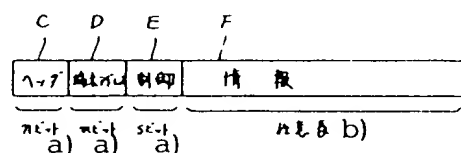Key: a) Superimposition; b) Vertically synchronous section.

Figure 2
Key: C... Header; D... Terminal address; E... Controlling part; F... Information; a) bits; b) Desired length.
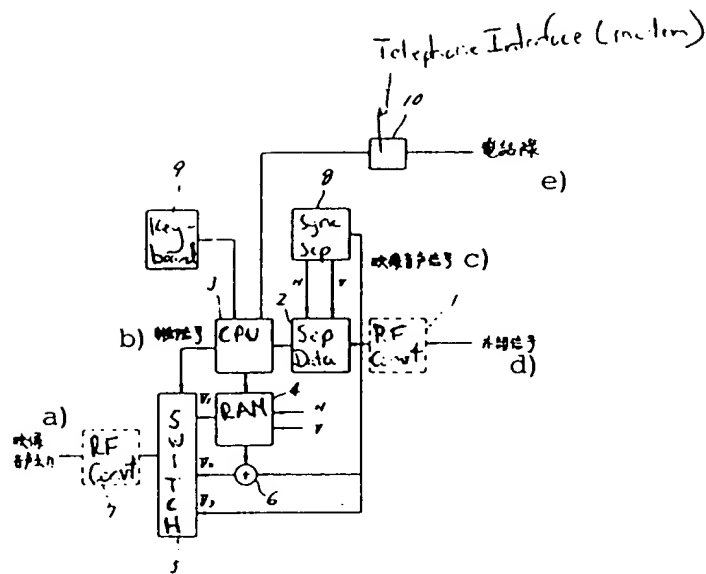
Figure 3
Key: a) Video audio output; b) Controlling [illegible] signal;
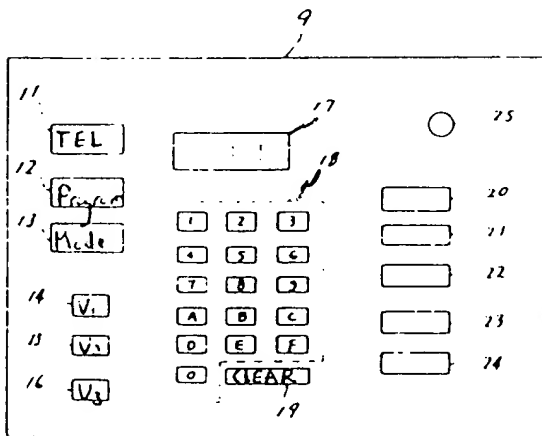c) Video audio signal; d) External signal; e) Telephone line.

Figure 4

17 ≈ Display of pressed Keys

18 ≈ Keys

TEL = key established connection w/ broadcast station

Program =

Mode = Key controls switch (5) via a selection of keys 14-16
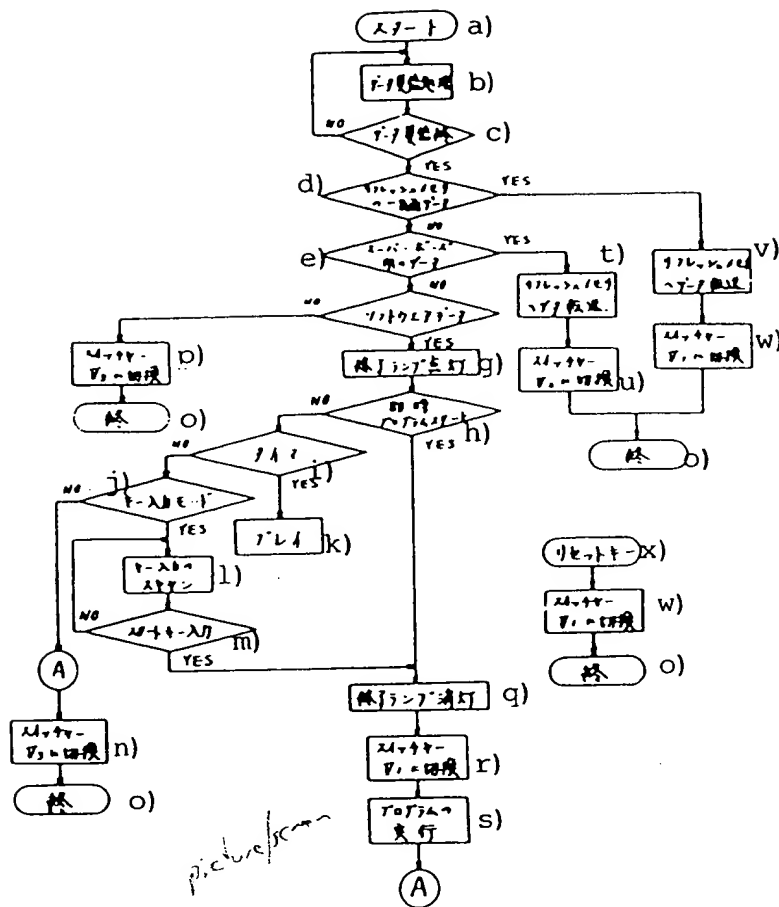
Figure 5

Key: a) Start; b) Data receiving process; c) End of data receiving; d) One [illegible] data of refresh memory; e) Data for super pause; f) Software data; g) END light ON; h) [illegible] program START; i) Timer; j) Key imput mode; k) Play; l) Key input scan; m) START key imput; n) Switch to Switcher V_3; o) END; p) Switch to Switcher V_3; q) END light OFF; r) Switch to Switcher V_1; s) Activate program; t) Data transfer to refresh memory; u) Switch to Switcher V_2; v) Data transfer to refresh memory; w) Switch to Switcher V_1.; x) Reset key.

13